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REMARKS/ARGUMENTS

Claims 1-11 are pending in this application.

The Examiner objected to the drawings because "an input tuning circuit" is allegedly not shown. Applicants respectfully traverse this objection. The second full paragraph on page 1 of the originally filed specification clearly discloses that Fig. 1 shows "a variable bandpass filter (BPF) 5 that functions as an input tuning circuit..." Thus, contrary to the Examiner's allegation, an input tuning circuit is clearly shown in Fig. 1, in the form of the variable bandpass filter 5. Accordingly, Applicants respectfully request reconsideration and withdrawal of this objection.

Claim 1 was rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Particularly, the Examiner alleged that "it is unclear which 'input tuning circuit' is intended." Applicants do not understand this rejection. Claim 1 clearly and definitely recites "an input tuning circuit for tuning to an RF signal of a desired channel among RF signals of a plurality of channels input from the input terminal," and the remainder of claim 1 properly refers to "the input tuning circuit." Claim 1 does not recite more than one input tuning circuit. Thus, Applicants respectfully submit that the recitations of "the input tuning circuit" are clear and definite.

It appears that the Examiner may be confused as to what illustrated element corresponds to the input tuning circuit. However, as noted above, the bandpass filter 5 shown in Fig. 1 is specifically disclosed as functioning as an input tuning circuit. Thus, Applicants respectfully submit that the recitation of the "input tuning circuit" recited in claim 1 is fully supported in the originally filed specification and is sufficiently definite so as to comply with 35 U.S.C. § 112, first and second paragraphs.

Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

Claims 1, 3 and 4 were rejected under 35 U.S.C. § 102(e) as being anticipated by Kunishima (U.S. 6,037,999). Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kunishima. Claims 5-7 were rejected under 35 U.S.C. §

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103(a) as being unpatentable over Kunishima in view of Boulic (U.S. 6,081,151). Claims 7-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kunishima in view of Aoki et al. (U.S. 4,369,414). Applicants note that claim 7 has been listed in two different prior art rejections. However, since the Examiner specifically referred to claim 7 in the description of the rejection under 35 U.S.C. § 103(a) as being unpatentable over Kunishima in view of Boulic, and has NOT referred to claim 7 in the description of the rejection under 35 U.S.C. § 103(a) as being unpatentable over Kunishima in view of Aoki et al., Applicants assume that the Examiner did not intend to include claim 7 in the rejection under 35 U.S.C. § 103(a) as being unpatentable over Kunishima in view of Aoki et al. Applicants respectfully traverse these rejections.

Claim 1 recites:

“A tuner circuit comprising:
an input terminal;
an input tuning circuit for tuning to an RF signal of a desired channel among RF signals of a plurality of channels input from the input terminal;
a variable-gain amplifier circuit for amplifying or attenuating a level of an RF signal output from the input tuning circuit to a prescribed level;
a pre-amplifier circuit disposed at an upstream side of the input tuning circuit; and
a variable attenuator circuit disposed at an upstream side of the pre-amplifier circuit, including a PIN diode disposed in series with a signal path of the tuner circuit, the PIN diode having characteristics between direct current and intermodulation distortion such that intermodulation distortion of a signal that flows therethrough is maximized at a desired value of a direct current; wherein
the variable-gain amplifier circuit and the variable attenuator circuit are controlled according to a common AGC voltage that is set based on a level of an input RF signal, and operations of the variable-gain amplifier circuit and the variable attenuator circuit in relation to the AGC voltage are set such that when the input RF signal is at a maximum assumed level, a direct current that flows through the PIN diode is less than the predetermined value of a direct current that maximizes intermodulation distortion.” (emphasis added)

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With the unique combination and arrangement of features recited in Applicants' claim 1, including the features of "the variable-gain amplifier circuit and the variable attenuator circuit are controlled according to a common AGC voltage that is set based on a level of an input RF signal, and operations of the variable-gain amplifier circuit and the variable attenuator circuit in relation to the AGC voltage are set such that when the input RF signal is at a maximum assumed level, a direct current that flows through the PIN diode is less than the predetermined value of a direct current that maximizes intermodulation distortion," Applicants have been able to provide a tuner circuit in which intermodulation distortion in a variable attenuator circuit is greatly suppressed and in which distortion in a pre-amplifier circuit is greatly suppressed (see, for example, the first full paragraph on page 4 of the originally filed specification).

The Examiner alleged that Kunishima teaches all of the features recited in claim 1, including "an input (11); a variable gain amplifier (4); a pre-amplifier (2); and a variable attenuator (1) including PIN diode (1a, 1b), wherein the structure recited in Kunishima (Fig. 1) is identical to that of the applicant's claims. As such, the claimed functions are presumed to be inherent." Applicants respectfully disagree.

Contrary to the Examiner's allegations, although Kunishima teaches circuit elements that are similar to the circuit elements recited in Applicants' claim 1, the functions performed by the circuit of Kunishima are clearly very different from the functions performed by the circuit recited in Applicants' claim 1, and are clearly not inherent as alleged by the Examiner.

As the Examiner is undoubtedly aware, the function and operation of any circuit element is determined based on the specific components that are provided in the circuit element, the electrical characteristics of each of these specific components, and the arrangement and connections of the various circuit components. Thus, the mere fact that two circuits may include similar circuit elements certainly does not mean that these two circuits will inherently operate in the same manner or perform the same functions.

For example, Fig. 3 of Kunishima shows a curve X which represents the gain

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attenuation characteristic for the AGC voltage of the variable gain amplifying circuit 4, and a curve Y represents the attenuation characteristic for the AGC voltage of the variable attenuation circuit 1 (see col. 5, lines 46-53 of Kunishima). Fig. 4 of the present application shows a dashed-line curve which represents the gain attenuation characteristics for the AGC voltage of variable-gain amplifiers a and b, and a solid line curve which represents the attenuation characteristic for the AGC voltage of the variable attenuator circuit.

By comparing Fig. 3 of Kunishima and Fig. 4 of the present application, the attenuation characteristic of the variable gain amplifying circuit 4 of Kunishima is clearly very different from the attenuation characteristics of the variable gain amplifier circuits a and b of the present invention, and the attenuation characteristic of the variable attenuation circuit 1 of Kunishima is clearly very different from the attenuation characteristic of the variable attenuation circuit of the present invention.

Thus, Fig. 3 of Kunishima and Fig. 4 of the present application clearly illustrate that the mere fact that two circuits may include similar circuit elements, does not lead to the conclusion that the function and operation of one of the two circuits is inherently the same as the function and operation of the other of the two circuits.

Kunishima fails to teach or suggest anything at all about intermodulation distortion or a predetermined value of a direct current that maximizes intermodulation distortion. Thus, Kunishima certainly fails to teach or suggest the features of "the variable-gain amplifier circuit and the variable attenuator circuit are controlled according to a common AGC voltage that is set based on a level of an input RF signal, and operations of the variable-gain amplifier circuit and the variable attenuator circuit in relation to the AGC voltage are set such that when the input RF signal is at a maximum assumed level, a direct current that flows through the PIN diode is less than the predetermined value of a direct current that maximizes intermodulation distortion" as recited in Applicants' claim 1.

Accordingly, Applicants respectfully request reconsideration and withdrawal of

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the rejection of claim 1 under 35 U.S.C. § 102(e) over Kunishima.

The Examiner has relied upon Boulic and Aoki et al. to allegedly cure various deficiencies of Kunishima. However, neither Boulic nor Aoki et al. teaches or suggests the features of "the variable-gain amplifier circuit and the variable attenuator circuit are controlled according to a common AGC voltage that is set based on a level of an input RF signal, and operations of the variable-gain amplifier circuit and the variable attenuator circuit in relation to the AGC voltage are set such that when the input RF signal is at a maximum assumed level, a direct current that flows through the PIN diode is less than the predetermined value of a direct current that maximizes intermodulation distortion" as recited in Applicants' claim 1.

Accordingly, Applicants respectfully submit that Kunishima, Boulic and Aoki et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in Applicants' claim 1.

In view of the foregoing amendments and remarks, Applicants respectfully submit that claim 1 is allowable. Claims 2-11 depend upon claim 1, and are therefore allowable for at least the reasons that claim 1 is allowable.

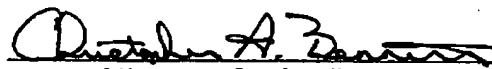
In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

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The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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